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News Release

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Record Snowpack Falls on Alaskan Glacier Despite Worldwide Glacier Retreat

Editors: Photos available for downloading are available at
http://ak.water.usgs.gov/glaciology/news/200305_gulkana_record/pr_photos.htm

The largest snowpack in 37 years fell on Gulkana Glacier, Alaska, this past winter. This comes at a surprising time when most of the mountain glaciers of Alaska and in fact the world are getting smaller at an accelerating rate.

Does the record snowpack indicate that glacier shrinkage has ended?

That's a premature and unlikely conclusion, according to U.S. Geological Survey hydrologist Rod March, who made the measurement at Gulkana Glacier. "Like many Alaskan glaciers, Gulkana Glacier has been shrinking for the last 100-120 years and it will take more than one winter to turn things around," says March.

As determined by measurements at three different elevations on the glacier, the early May snowpack measurement averaged 5.9 feet of water equivalent for the entire glacier. This compares with a 37-year average snowpack of 3.7 feet water equivalent and a previous record snowpack of 5.2 feet water equivalent in 1968.

A record snowpack is not necessarily an indication of glacier growth, according to Steve Frenzel, chief of USGS Water Resource Investigations in Alaska. "Snowpacks at Gulkana Glacier are less variable than summer melt," Frenzel said. "That means that an exceptional spring snowpack can be wiped out by a summer melt season only a little greater than normal."

Frenzel pointed out that despite large snowpacks in 2000 and 2001, those years ended the melt season with negative annual mass balances. Frenzel said the possible effect of this year's large snowpack on the annual mass balance would not be known until measurements are made at the end of the summer. "The annual mass balance of Gulkana Glacier correlates better with summer melt than with the spring snowpack," Frenzel said, explaining that "mass balance" is the annual amount of water added to the glacier by precipitation, minus the water lost from the glacier by melting and evaporation. " If the mass balance is positive, the glacier is growing; if it's negative, the glacier is shrinking."

The large Gulkana snowpack measured by the USGS contrasts with the monthly measurements made by the U.S. Department of Agriculture's Natural Resources Conservation Service http://www.ak.nrcs.usda.gov/, which showed the early May snowpack in the area to be less than 50 percent of normal. The difference between USGS and NRCS snowpacks for the same area probably reflects real variations with altitude. Nearby NRCS measurement sites are lower in altitude than Gulkana Glacier.

Typically, snowpacks on central and south-central Alaskan glaciers reach their maximum between late April and late May. The water equivalent of a snowpack is how deep it would be if you melted the snowpack. For snowpacks on Alaskan glaciers, the equivalent water depth is typically one-third to one-half the depth of snow. For example, a 10-foot-deep snowpack would typically yield 3 to 5 feet of water. The deepest measurement this year was 14.6 feet of snow (7.0 feet water equivalent) at 6,025 feet elevation.

More information may be accessed at:
ftp://ftp.wcc.nrcs.usda.gov/support/snow/snowpack_maps/alaska/wy2003/aksn0305.gif or visit the UGSG glaciology web page http://ak.water.usgs.gov/glaciology/ for updates.

Gulkana Glacier (lat 63°16’N., Long 145°25’W.) is located on the south side of the Alaska Range about 10 miles north of Paxson, along the Richardson Highway. The USGS has measured the mass balance, climate, and runoff at Gulkana Glacier since 1966 as part of a program to document long-term glacier and climate trends. In general, the long-term trend indicates that the glacier is shrinking.

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